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Factors affecting caesarean rates: findings from a cohort in Northern Portugal

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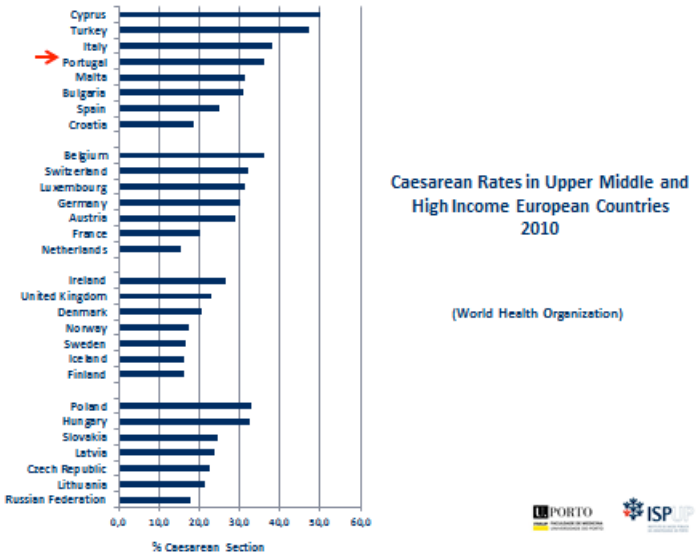
Good afternoon everyone, let me start by introducing my research work. I have an interest in obstetric interventions in Portugal and I am particularly interested in caesarean section (C-section) rates and their determinants. According to this graph (Figure 14) there is a marked variability in C-section rates across European countries. This variability is, of course, due to differences in obstetric care, but this graph shows an interesting geographical pattern. You see in the southern European countries we observe the highest C-section rates. This highlights two important aspects: on the one hand women´s views and preferences regarding childbirth and on the other hand the views and preferences of obstetricians, the caregivers, with their perception of obstetric risk, convenience, fear of litigation, everything. We aimed to explore the question: why are caesarean rates so high in Portugal? Currently the prevalence of caesarean rates in Portugal is 36%. Why is it so high?

Figure 14: Caesarean Rates in Upper Middle and High Income European Countries 2010[1]



[1] Based on WHO data: data.euro.who.int/hfadb

We addressed this question by using baseline data from a birth cohort "Generation 21". Women delivering a live birth in five public hospitals in the north of Portugal were invited to participate in the cohort between April 2005 and August 2006. The final sample comprises almost 8,500 women. For our study we only considered women with a singleton pregnancy (8,351 women). This table (Figure 15) provides information about the distribution of women according to the labour onset and the mode of delivery and according to the hospital where delivery occurred.

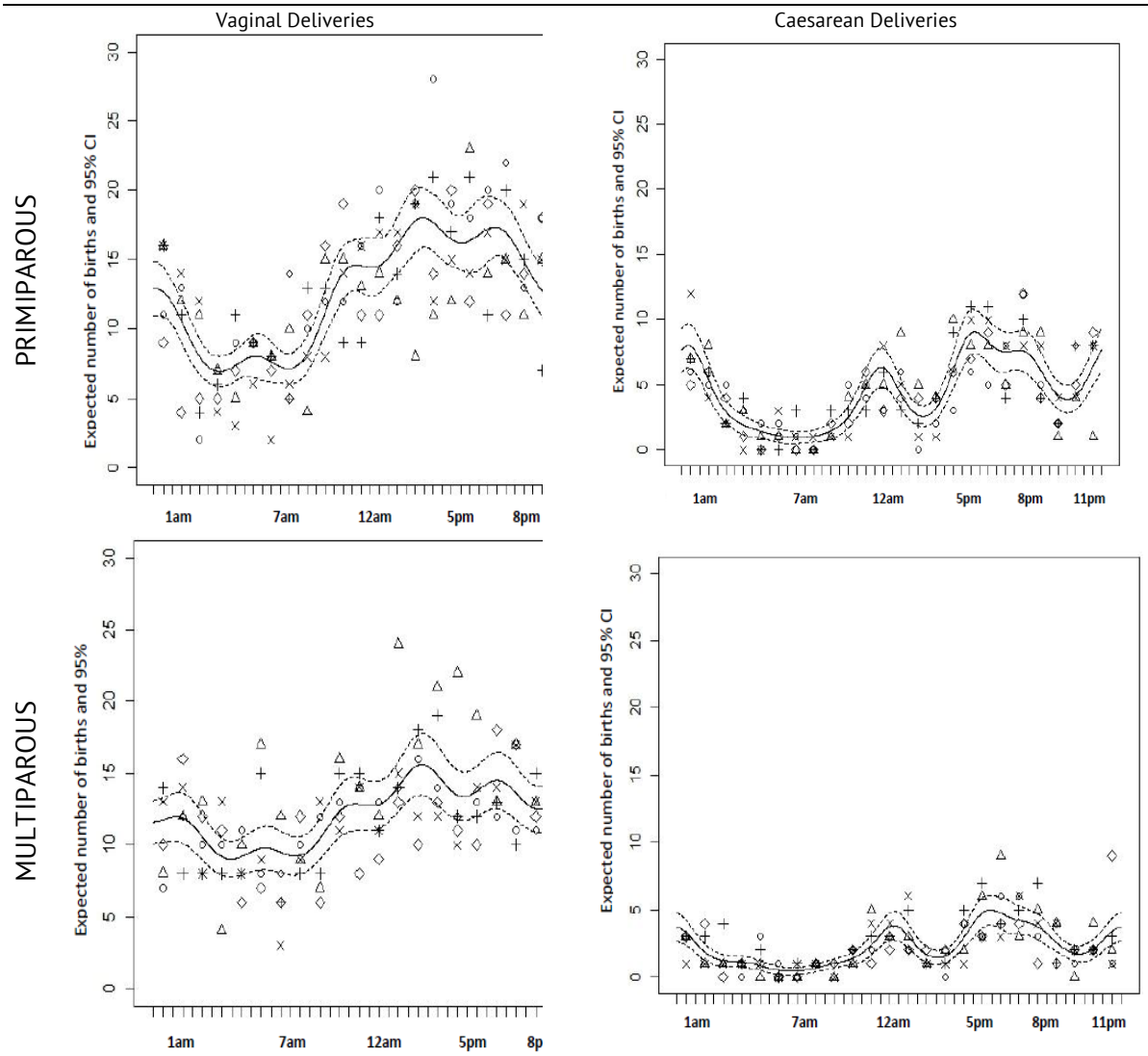
Figure 15: Labour Onset and Mode of Delivery by Hospital

n (%)	All	According to the hospital					p-value
		1	2	3	4	5	
All	8351	1984	1404	884	2040	2039	
Labor Onset							
Spontaneous	5208 (62.4)	1223 (61.6)	1063 (75.7)	362 (41.0)	1303 (63.9)	1257 (61.6)	
Induced	2041 (24.4)	455 (22.9)	237 (16.9)	369 (41.7)	468 (22.9)	512 (25.1)	<0.001
Cesarean before labor	903 (10.8)	235 (11.8)	93 (6.6)	119 (13.5)	235 (11.5)	221 (10.8)	
Not classifiable	199 (2.4)	71 (3.6)	11 (0.8)	34 (3.8)	34 (1.7)	49 (2.4)	
Mode of Delivery							
Vaginal eutocic	4205 (50.4)	1032 (52.0)	748 (53.3)	379 (42.9)	1073 (52.6)	973 (47.7)	
Vaginal instrumental	1170 (14.0)	285 (14.4)	286 (20.4)	139 (15.8)	218 (10.7)	142 (11.8)	<0.001
Caesarean section	2976 (35.6)	667 (33.6)	370 (26.4)	366 (41.4)	749 (36.7)	824 (40.4)	

As you see there is a big difference in the proportion of induced labour by hospital, varying from between 17% and 42%, and the C-section rate varied in total between 26% and 41%. Caesarean section before labour onset varied between 7% and almost 14%. Well, caesarean section is a key procedure, when the timing of delivery is important. So we conducted an analysis to understand the hourly distribution of births, but including only births after spontaneous labour onset (Figure 16).

From the over 5000 women with spontaneous labour onset, 22% had a caesarean section and in the following graphs you see the distribution of births according to the hour of the day and the mode of delivery, both among prima-parae and multi-parae women. As you see there is a clear deficit of nocturnal births, but caesarean section presents an interesting pattern. Between 12 o'clock midday and 2pm there is a sudden decrease followed by an upward trend, in surgical deliveries. Well, we cannot say that the working activity in hospitals influences the rates but it at least influences the time when caesarean section is performed.

Figure 16: Hourly Distribution of Births Following Spontaneous Labour Onset



Another issue is the risk of caesarean section after induced labour. According to the American Congress of Obstetricians and Gynaecologists and the Royal College of Obstetrics and Gynaecologists there are a set of indications for labour induction, as you see in this slide (Figure 17).

Figure 17: ACOG and RCOG Guidelines for induced labour

Source: www.acog.org and www.rcog.org.uk

Well, there are differences in the distribution of women according to a set of maternal characteristics and by the hospital where delivery occurred. In this table we only included women with induced labour. As you see, the proportion of women with no indication for induced labour, among women with labour induction varied across hospitals between 20% and 45% (Figure 18).

Figure 18: Mode of delivery of women who underwent induction, by hospital

HOSPITAL	1 n=455	2 n=237	3 n=369	4 n=468	5 n=512	p-value
	N (%) or mean ± standard deviation					
Maternal age (years)	29.4±5.86	30.5±5.44	30.3±4.98	29.6±4.81	28.9±5.59	<0.001
Education level (years)						
=<6	162 (35.9)	68 (28.8)	77 (20.9)	101 (21.7)	147 (28.9)	
7 – 9	114 (25.3)	51 (21.6)	86 (23.3)	97 (20.8)	181 (35.6)	
10 – 12	83 (18.4)	49 (20.8)	100 (27.1)	125 (26.8)	103 (20.2)	<0.001
> 12	92 (20.4)	68 (28.8)	106 (28.7)	143 (30.7)	78 (15.3)	
Parity and previous CS						
Primiparous	275 (60.4)	142 (59.9)	243 (65.9)	316 (67.5)	329 (64.3)	
Multiparous no CS	137 (30.1)	74 (31.2)	90 (24.4)	105 (22.4)	126 (24.6)	0.142
Multiparous previous CS	43 (9.5)	21 (8.9)	36 (9.8)	47 (10.1)	57 (11.1)	
Body Mass Index (Kg/m^2)						
<25.0	195 (59.2)	147 (63.6)	263 (73.8)	304 (67.1)	306 (62.6)	
25.0 – 29.9	90 (27.4)	58 (25.1)	65 (18.3)	101 (22.3)	130 (26.6)	0.010
>=30	44 (13.4)	26 (11.3)	28 (7.9)	48 (10.6)	53 (10.8)	

Antenatal care						
Only public services	328 (73.1)	146 (66.4)	184 (50.1)	209 (45.0)	321 (70.1)	
At least 1 visit to private services	121 (26.9)	74 (33.6)	183 (49.9)	255 (55.0)	137 (29.9)	<0.001
Indications for induction*						
None	**133 (29.2)**	**48 (20.3)**	**154 (41.7)**	**198 (42.3)**	**233 (45.5)**	
One	**199 (43.7)**	**124 (52.3)**	**161 (43.6)**	**188 (40.2)**	**185 (36.2)**	**<0.001**
Two or more	**120 (26.4)**	**59 (24.9)**	**49 (13.3)**	**74 (15.8)**	**83 (16.2)**	
No information (%)	**0.7**	**2.5**	**1.4**	**1.7**	**2.1**	
Mode of delivery						
Caesarean	161	77 (32.5)	150 (40.7)	214 (45.7)	248 (48.4)	
(35.4)		160 (67.5)	219 (59.3)	254 (54.3)	264 (51.6)	<0.001
Vaginal	294 (64.6)					

We weighted the association between the hospital where delivery occurred and surgical delivery after induced labour. As you see in this table (Figure 19), there were stronger differences between hospitals in the risk of caesarean section after labour induction, but these differences are stronger among women induced with no indication for induction.[2]

Figure 19: Association between the hospital and surgical delivery after induced labour

Association between the hospital and surgical delivery after induced labour

	with no indication for induction		with at least one indication for induction	
	% Caesarean	PR* (95% CI)	% Caesarean	PR* (95% CI)
Hospital				
1	21.8	reference	41.4	reference
2	41.7	1.65 (1.07 – 2.55)	30.6	0.82 (0.64 – 1.05)
3	34.4	1.37 (0.94 – 2.00)	44.8	1.12 (0.92 – 1.36)
4	39.4	1.59 (1.12 – 2.27)	51.1	1.22 (1.03 – 1.46)
5	46.8	1.87 (1.33 – 2.62)	50.4	1.27 (1.06 – 1.51)
	p<0.001		p<0.001	

PR, prevalence ratio
* adjusted for maternal age, BMI, parity and previous caesarean

[2] For more details on these findings see www.biomedcentral.com/1756-0500/6/214, accessed 28 January 2014.

European research has shown differences in caesarean section according to the country of origin. We classified women in our study into four groups according to the country of origin: Portuguese, other Europeans, African and Brazilian women. As you know in Portugal, immigration is related to former colonial ties. So the majority of immigrant women are African women from Portuguese-speaking countries, such as Mozambique or Angola, and Brazilian women. We decided to evaluate the association between caesarean section and the country of origin of these women. As you see in this table (Figure 20), Brazilian women are more likely to have a caesarean section. This is true for primiparous Brazilian women, as well as for multi-parous women and both for caesarean before labour and during labour.

Figure 20: Risk of caesarean-section according to country of birth

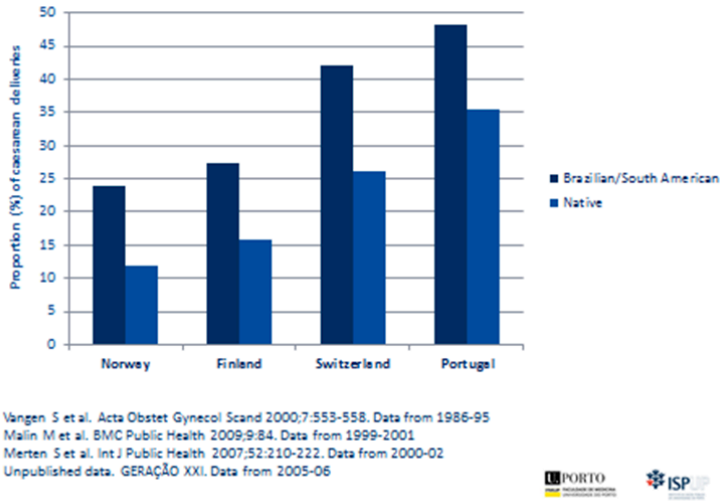
Risk of caesarean-section according to the country of birth.

		Parity		Timing of caesarean section	
	All PR* (95% CI)	Primiparous PR† (95% CI)	Multiparous PR‡ (95% CI)	Before labour PR* (95% CI)	During labour PR* (95% CI)
Portuguese	reference	reference	reference	reference	reference
Non-Portuguese European	0.91 (0.69 – 1.22)	0.84 (0.58 – 1.22)	1.15 (0.79 – 1.66)	0.84 (0.41 – 1.75)	0.95 (0.67 – 1.33)
African	1.02 (0.79 – 1.32)	0.97 (0.66 - 1.44)	1.09 (0.79 – 1.51)	1.13 (0.68 – 1.89)	0.98 (0.68 – 1.41)
Brazilian	**1.26 (1.08 – 1.47)**	**1.19 (0.97 – 1.47)**	**1.39 (1.12 – 1.73)**	**1.43 (0.99 – 2.06)**	**1.30 (1.07 – 1.58)**

PR, Prevalence Ratio; CI, Confidence Interval
*Adjusted for maternal age, parity and previous c-section and fetal presentation.
† Adjusted for maternal age and fetal presentation
‡ Adjusted for maternal age, parity and previous caesarean section and fetal presentation

Compared with other studies from other European countries, Brazilian and/or other South American women present a higher frequency of caesarean section whatever the host country. But as you see in this graph (Figure 21) this prevalence of C-section among immigrant Brazilian women depends on the caesarean section rate among women in their host country.

Figure 21:C-section rates amongst immigrant Brazilian/South American women and non-immigrant women in four European countries



What does this mean? Well this means that there is an interplay between women, their cultural views regarding childbirth and the obstetrician or the hospital. And as you see, according our findings, it is interesting to see this interplay because country of origin, the context of hospital practice, and institutional protocols drive caesarean section in Portugal. Here I tried to give an overview of childbirth in the Portuguese context and if you have any answers I will do my best to answer them.

Plenary Discussion

Maria Schouten: Thank you. This is about real medicalization. Before the break we heard about "the other side", the de-medicalization, and it is interesting to compare this. I also have a question, I was remembering what Soo said about two hospitals not far away from each other in the United Kingdom which had very different rates of caesareans. Perhaps there is also a relationship with the type of patient and their wishes. And perhaps what the patient – I say patient, woman – wants is not always taken into account. This is a question which we can save for the debate. Now we have questions for Cristina and Rita, the President of HumPar.

Soo Downe: Cristina, going back to your data. I think the primaparae data is not significant statistically, is it? I´m wondering if it´s because those women have primary C-sections, they´ve come from Brazil with primary sections, so this is in answer to the choice question really. As women have come from Brazil with prior sections they are more likely to have secondary sections. Do you think this might be a causal factor here?

Cristina Teixeira: There are many factors influencing these results. First, these Brazilian women are recent immigrants to Portugal so probably the first child was born in

Brazil, so I don´t know, but it´s probable that they bring their perception of obstetric care from the Brazilian context. Probably the first experience of childbirth is important.

Participant: I would like to follow up on Soo´s question because what is the attitude in Portuguese hospitals to vaginal birth following caesarean section (VBAC)? Often if a woman has C-section then the following births will also be C-sections. Also there is often an attitude amongst obstetricians and midwives that this is necessary: "once caesarean section always caesarean section" they say. So I want to know what are the policies in Portuguese hospitals?

Cristina Teixeira: Well among these women, in this sample, out of women with a previous C-section, 70% had another C-section. I think it´s the current policy in the Portuguese system.

Joanna White: Is there anyone here from the Portuguese medical sector- obstetricians or midwives – who would like to comment on this based from their experiences. Is it policy in Portuguese hospitals to conduct C-sections if the first delivery was a C-section?

Participant: I have a friend and her first delivery was a caesarean, then she did not want to have one for the second baby but she had to. So for the third child there was no doctor available for a normal delivery so she had to do it at home, and that was, well she tried every doctor and none of them agreed to support a normal delivery. That´s just an example.

Participant: Do I understand the data correctly, that most women are in two kinds of care: public and private care? So they pay fees for private care?

Cristina Teixeira: No. In this sample, all women were recruited from public hospitals. Childbirth services free of charge. Regarding prenatal care in Portugal, in this context, almost 40% of women are followed during pregnancy by private physicians. For childbirth here, all deliveries were in public hospitals.

Participant: I am just helping this lady next to me as she says she does not speak English well. She works in Garcia de Horta hospital in Almada, she is a midwife there, and it is not current practice if you first have a C-section to have a second one. So like it was said, "you can be lucky". In some hospitals you get doctors who will help you to have a natural birth and in others you won´t, so I think it´s luck. She had a C-section first and then a natural birth so it really depends on what you get.

Participant: The policies are changing, and things have been changing since 2005-2006, I think, towards the empowerment of midwives, so it is probably one of the reasons things are changing. My question is to the previous presenter. I must say that I am a little bit sceptical about homebirth. I was in the UK some years ago and what I saw was that the movements towards normal birth are not necessarily towards homebirth, they are towards

birth centres[3] and non-hospital birth but not birth at home. What I missed in the previous presentations was prenatal care, as I think the main way to change mentalities is with prenatal care. And how about the referral system with homebirth? Because I think this is one of the reasons you hear in the media about the bad situation and so. The government does not pay for homebirth so what happens if a woman needs to go to hospital in an emergency? And what about the time it takes her to get there? The birth centres I visited in the UK had a very strong referral system – they only had low-risk women, of course, but even so they only needed 10 or 15 minutes to transfer if there was an emergency. So I think these are the main issue: that the movement towards normal birth and homebirth must ensure with the government that referral systems are in place.

Rita Correia: First of all my presentation was not just about homebirth. It is an issue and it was presented, I hope – and if it was not I apologise - not as an alternative but as something we should make available. It is something which should be available as a matter of choice and to ensure rights for women. It does not mean that all women would prefer that. People have the right to be skeptical but it also has to do with a change in mentality. It is impossible in any scenario to guarantee a risk-free birth – you can never say that. And it´s a question of changing mentalities so that the women who want to give birth at home should be listened to and they need to be acknowledged as reasonable women who are not going to endanger their child´s life.

And of course it is very important to have referral systems, which we currently do not have at all. Not only referral systems but protocols available which professionals should use like they do in hospital. So of course it is very important. So one thing is fighting for the right to have a normal birth in Portugal.

Another linked thing: the right for a woman to freely choose where she gives birth to her child, which is something which the WHO encourages.

Participant: I am really happy to hear someone talking about prenatal care because usually we just focus on birth, but in fact birth starts in prenatal care. In my pregnancy I had prenatal care just with a midwife, and it is not easy to do that in Portugal. I know many, many midwives that do not feel safe to do pre-natal care. They do not feel prepared to do it. And I can say that 98% of women have prenatal care with physicians, and this is not necessary. During the coffee break I was talking to some midwives (nurse-specialists[4]) and I think we should think about changing the system of training. I love all of you - because they are rare, in fact, those who are midwives in their heart and soul! And most of the midwives (nurse-specialists), they really like the medical model. This is a very important issue. We need direct entry, we need to change what we have in Portugal, because we need to change prenatal care, because right now prenatal care is really interventionist. I agree it is not about homebirth, but it is related to homebirth because women who want to choose a homebirth

[3] See footnote 2, page 14.

[4] See footnote 4, page 47.

need to be protected and we need guidelines and safety for homebirth in Portugal. But maybe we should start by looking at prenatal care because this care hands on these kinds of features, even if women go to public hospitals. This is my opinion.

Joanna White: Can I just add that in my study I have been interviewing midwives and when you say most of them like intervention, well I wouldn´t agree with that. So far, when I´ve asked midwives about their definition of normal birth, for example, they ask "do you want my interpretation of normal birth, or the interpretation applied where I am working and what I have to do?" I think that´s a very important thing: the role of the institution. Midwives may have their own personal view and perhaps would love to engage in a different way but it´s a question of whether they are able to do that or not. So I´m a bit sceptical about generalizing about all midwives.

Participant (translating for another): She [referring to another participant] is one of the proponents for the rights of natural birth – normal birth, sorry. She says that one of the difficulties they engage with is who has the right to make the decision concerning C-section. Can the woman make this decision or is it up to the doctor? So it´s like the woman is never entitled to her own views. Maybe she wants a natural birth but then the doctors, the nurses, they lead her into choosing a C-section, for lots of different reasons, like the need to make sure the baby is born alive ("for the baby´s own good"). It´s about culture. The doctor always has the power to decide what is the best delivery for that woman. And C-section is the most likely outcome. This is about culture, not choice. The midwife has a different point of view. But the person in charge of the birth is always a doctor so in the end his/her word is more powerful than that of the midwives. And the midwives need to have jobs, and if it is a C-section they won´t have jobs because in the end it´s the doctor who does it. The thing is, it´s not when you are in labour, it is when you are pregnant that these things start. She is Brazilian, but lives here and is talking about Portugal.

Soo Downe: It´s great to have all these conversations – it´s fantastic! I just wanted to respond to a few points you made. Firstly you challenged the natural birth movement to get referral right. I challenge the government to get referral right. Because it´s not up to the humanization of birth movement to get this right for the safety of mothers and babies, it´s up to the government. But that will come as a result of pressure from women. The second thing I would say is that experience in the UK, in America and Australia is that where you make homebirth difficult women will make that choice anyway, and there will be an increase in death. So not having the homebirth available - and it needs to be made available safely – is dangerous. Thirdly, regarding prenatal education, I do agree, but again we have a problem sometimes in the UK. I am going to use the National Childbirth Trust (NCT) as an example here[5] although I don´t want to stereotype it: women get fantastically good education about normal birth, they hit the maternity units and then things happen to them

[5] The National Childbirth Trust is the leading charity offering information and support in pregnancy, childbirth and early parenthood in the UK. Their activities include providing antenatal and postnatal courses. See www.nct.org.uk

which they do not expect, and they are profoundly distressed because of the difference between their expectation and their experience.

So one of the reasons that we started the campaign for normal birth in the UK was that we realized that women were making sensible choices for elective caesarean because we do birth so badly. Why would they expose themselves to the kind of birth we do? Instead they chose C-section. So our idea in starting the campaign was to get midwives to deliver proper physiological labour and birth, then when women are educated about physiological labour and birth that is what we will get, rather than a dissonance between what they are taught and what they get.

And one very final point – an upbeat point as I think some of this can be quite negative – is, I don´t know if you know but in Brazil now in the last couple of years the Ministry of Health has set up birth centres all across Brazil, across the whole country[6]. It´s a massive movement in the Ministry of Health to get birth centres started – and is opposed by the obstetricians it must be said – but the Ministry is keen to normalize birth. So there is always hope.

Maria Schouten: Thank you all. This debate could continue for a while, and will no doubt continue in the future, but now we have another presentation which promises to be very interesting too and will complement what has been discussed up to now. I would like to introduce Vítor Varela. He is the President of the College of Maternal Health and Obstetric Nursing and is also involved in the movement for the Right to Normal Birth (Pelo Direito ao Parto Normal), and he is monitoring the only active water birth unit in a public hospital in Portugal, which is in Setúbal.

[6] For more information see the website of the Brazilian Ministry of Health: portalsaude.saude.gov.br/index.php/cidadao/principal/agencia-saude/noticias-anteriores-agencia-saude/4082- (Portuguese only).